

I claim:

1. A device for cutting and bending rebar, comprising:

a longitudinally-extended main frame;

a shaft assembly connected to said main frame and movable along a first, longitudinal axis (A-A) between a first, retracted position and a second extended position and having a first end and an opposite, second end;

a first, movable cutting head carried by the shaft assembly and movable therewith along axis (A-A);

a second, fixed cutting head disposed such that the first cutting head is substantially adjacent to the second cutting head when the shaft assembly is in the extended position;

a crankshaft assembly disposed for pivotal rotation about a first rebar bending axis (B-B) substantially perpendicular to the first longitudinal axis (A-A) in response to longitudinal movements of the shaft assembly;

means attached to the shaft assembly for coupling the shaft assembly to the crankshaft assembly;

a first, driven rebar bending wheel mounted on the crankshaft assembly for rotation about the first rebar bending axis (B-B);

a second, idler rebar bending wheel longitudinally spaced-apart from the first wheel and rotatable about a second rebar bending axis (B'-B') that is parallel to the first rebar bending axis (B-B), the space between the first and second wheels defining a gap that is wide enough for insertion of a piece of rebar that is to be bended but narrow enough that the peripheral edges of the first and second wheels will be in frictional engagement with the inserted rebar;

a first bending block attached to, and rotatable with, the first wheel for bending into a first arc a piece of rebar inserted between the first and second wheels; and

linear actuator means attached to the main frame and in driving engagement with the first end of the shaft assembly for reciprocal movement of said assembly along the first, longitudinal axis (A-A);

whereby, in a first mode of operation, as the shaft assembly moves from the retracted position to the extended position, a piece of rebar inserted laterally between the first and second cutting heads will be sheared by the cutting heads, and, in a second mode of operation, as the shaft assembly moves from the retracted to the extended position, a piece of rebar inserted laterally between the first and second wheels will be moved laterally through the gap, engaged by said stop means, and bent in the direction of rotation of the first wheel to form a first arc.

2. The device of claim 1, further comprising a second bending block attached to, and rotatable with, the first wheel and circumferentially spaced-apart therefrom, for bending into a second arc a piece of rebar inserted laterally between the first and second wheels.

3. The device of claim 2, wherein the linear actuator means includes a hydraulic drive system, said system including a double-acting, single rod, hydraulic cylinder, said rod being in driving engagement with the first end of the shaft assembly.

4. The device of claim 3, wherein the shaft assembly includes
a shaft having a first end and a second, opposite end, said first end being attached to the rod of said hydraulic cylinder;

a cutting head carriage attached to said second end of the shaft and carrying said first cutting head, and

guide means attached to the main frame and longitudinally disposed on, and in sliding engagement with, opposite sides of the carriage to prevent lateral motion of the shaft assembly.

5. The device of claim 4, wherein the means for coupling the shaft assembly to the crankshaft assembly includes

a push rod disposed for movement along a second longitudinal axis (C-C) substantially parallel to the first longitudinal axis (A-A), said push rod having a first end attached to the carriage and an opposite, apertured, second end;

a clevis having two longitudinally-directed, laterally spaced-apart, apertured ears joined by a laterally-disposed base, said base having a bore for receiving the second end of the push rod;

a longitudinally-disposed link having a first, apertured end inserted between the ears of the clevis and an opposite, second end pivotally attached to the crankshaft assembly; and

a clevis pin inserted through apertures in the clevis ears and the aperture in the second end of the pushrod; whereby longitudinal movements of the shaft assembly cause pivotal movements of the crankshaft assembly.

6. The device of claim 5, wherein the second end of the link has an opening and the crankshaft assembly includes

a crankshaft aligned on the first rebar bending axis (B-B) and having an upper, relatively small diameter, cylindrical portion and a lower, relatively large diameter, cylindrical portion coaxial with the upper portion, the junction of said upper and lower portions defining a shoulder;

a crank having a first, upper end and a second, lower end joined by an intermediate neck portion, said upper end of said crank being attached to, and eccentrically-disposed with respect to, the lower portion of the crankshaft;

a crankshaft support leg coaxial with and extending away from the crankshaft, said leg being attached to said second end of said crank;

means for attaching the crank to the crankshaft;

means for attaching the crank to the crankshaft support leg; and wherein further said neck portion of said crank is inserted through said opening in said second end of said link.

7. The device of claim 6, wherein the means for attaching the crank to the crankshaft includes a first crankshaft pin press fitted through a first set of aligned apertures in an upper end of the crank and in the lower end of the crankshaft and a second crankshaft pin press fitted through a second set of aligned apertures in the crank and in the crankshaft support leg, and said means further includes plug welds in said first and second set of aligned apertures and welds attaching said crank to the crankshaft and to the leg.

8. A device for cutting and bending rebar, comprising:

a longitudinally-elongated main frame, said main frame including

two laterally spaced-apart, vertical sides, each side having a first end, an opposite, second end, and a rebar receiving slot intermediate the first and second ends, a laterally-disposed cylinder head having a longitudinally-directed cylinder head bore, said cylinder head joining the first and second ends of said sides, a laterally-disposed bulkhead intermediate the rebar receiving slot and the second ends of the sides and joining said sides, first and second, longitudinally-spaced apart wheel blocks mounted between upper portions of the sides, and a lower crankshaft support block mounted between lower portions of the sides;

a double-acting, single rod, hydraulic cylinder, mounted on the cylinder head with the rod thereof inserted through the cylinder head bore;

a shaft assembly movable along a first longitudinal axis (A-A) between a first, retracted position and a second extended position and having a first end attached to said rod and an opposite, second end;

a first, movable cutting head carried by the shaft assembly and movable therewith along the first longitudinal axis (A-A);

a second, fixed cutting head attached to the main frame and disposed such that the first cutting head is substantially adjacent to the second cutting head when the shaft assembly is in the extended position;

a crankshaft assembly mounted between lower crankshaft support block and the first wheel block for pivotal rotation about a first rebar bending axis (B-B) that is substantially perpendicular to the first longitudinal axis (A-A) in response to longitudinal movements of the shaft assembly;

a first, driven rebar bending wheel mounted on the crankshaft assembly for rotation about the first rebar bending axis (B-B);

a second, idler rebar bending wheel longitudinally spaced-apart from the first wheel and pivotally mounted to the second

wheel block for rotation about a second rebar bending axis (B'-B') that is parallel to the first rebar bending axis (B-B), the space between the first and second wheels defining a gap that is wide enough for insertion of a piece of rebar that is to be bended but narrow enough that the peripheral edges of the first and second wheels will be in frictional engagement with the inserted rebar;

means attached to the shaft assembly for coupling the shaft assembly to the crankshaft assembly;

a first bending block attached to, and rotatable with the first wheel for bending into a first arc a piece of rebar inserted between the first and second wheels; and

linear actuator means in driving engagement with the first end of the shaft assembly for reciprocal movement of said assembly along the first longitudinal axis (A-A);

whereby, in a first mode of operation, as the shaft assembly moves from the retracted position to the extended position, a piece of rebar inserted into the slot laterally between the first and second cutting heads will be sheared by the cutting heads, and, in a second mode of operation, as the shaft assembly moves from the retracted to the extended position, a piece of rebar inserted laterally between the first and second wheels will be bent in the direction of rotation of the first wheel.

9. The device of claim 8, wherein the bulkhead has a longitudinally-directed bulkhead bore, the second wheel is mounted for rotation on an idler shaft that is journaled within the second wheel block, the crankshaft assembly includes a crankshaft aligned on axis (A-A) and a cylindrical crank joined to the crankshaft, disposed parallel to the crankshaft, and offset therefrom, and said crankshaft assembly further includes a crankshaft support leg that is collinear with the crankshaft, said leg resting on a crankshaft bearing mount formed within the lower crankshaft support block, and wherein the means for coupling the shaft assembly to the crankshaft assembly includes

a push rod disposed for movement within the bulkhead bore along a second longitudinal axis (C-C) substantially parallel to

the first longitudinal axis (A-A), said rod having a first end attached to the carriage and an opposite, apertured, second end;

a clevis having two longitudinally-directed, laterally spaced-apart, apertured ears joined by a laterally-disposed base, said base having a bore that receives the second end of the push rod;

a longitudinally-disposed link having a first, apertured end inserted between the ears of the clevis and an opposite, second end pivotally attached to the crankshaft assembly; and

a clevis pin inserted through apertures in the clevis ears and the aperture in the second end of the push rod;

whereby longitudinal movements of the shaft assembly between the retracted and extended positions cause corresponding longitudinal movements of the first end of the push rod and, consequently, pivotal movements of the crankshaft and of the first wheel about axis (B-B).

10. The device of claim 9, wherein the main frame further includes

a horizontal bottom plate that joins and extends between lower portions of the sides and underlies the lower crankshaft support block; and

a horizontal top plate that extends from the second ends of the sides to the bulkhead and joins upper portions of said sides, said top plate having a first opening through which extends an upper portion of the crankshaft and a second opening through which extends an idler shaft

11. The device of claim 10, further comprising at least one rebar measuring gauge, means for attaching said gauge to the main frame adjacent the slot, and means for attaching said gauge to the main frame adjacent the gap between the first and second wheels.

12. The device of claim 11, further comprising a second bending block attached to, and rotatable with, the first wheel and circumferentially spaced-apart therefrom, for bending into a second arc a piece of rebar inserted laterally between the first and second wheels.